

REAL TIME SYSTEMS

JACK BURNHAM

*I read the news today oh boy
Four thousand holes in Blackburn
Lancashire
And though the holes were rather small
They had to count them all
Now they know how many holes it takes
To fill the Albert Hall
I'd love to turn you on*

Presently it will be accepted that art is an archaic information processing system, characteristically Byzantine rather than inefficient. To emphasize this cybernetic analogy, programming the art system involves some of the same features found in human brains and in large computer systems. Its command structure is typically hierarchical.¹ At the basic level artists are similar to programs and subroutines. They prepare new codes and analyze data in making works of art. These activities are supervised by metaprograms which consist of instructions, descriptions, and the organizational structures of programs. Metaprograms include art movements, significant stylistic-trends, and the business, promotional, and archival structures of the art world. At the highest level art contains a self-metaprogram which, on a long-term basis, reorganizes the goals of the art impulse. The self-metaprogram operates as an undetected overseer, establishing strategies on all lower levels in terms of societal needs. Because we have no comprehensive picture of human life, these needs remain rather obscure (*Zeitgeist* is not sufficiently teleologic to express the anticipatory monitoring function of the self-metaprogram).

Esthetic values emanate from the self-metaprogram. These are now changing, as evidenced by a number of symptomatic conditions: loss of interest in the gallery scene by the informed public, strong support for "street art" by several important critics, the "newsreels" of the underground cinema, anxiety marked by rising prices in blue-chip art, the fact that museums of modern art are closing the circuit on modernism, and the response to so politically inept a group as the Art Workers Coalition.

Values, though, are simply the result of long-term information processing structures. This is the business of museums and art historians. The more aggressive commercial galleries have long considered controlling and creating art information vital to selling, while not forgetting that sales are art information. The survival strategy of all social organizations, including the art system, is that of transforming preferred information into values.

In business this is taken for granted. At the management level, information "is data that has been culled, analyzed, interpreted, and presented on a selective basis in a manner useful for understanding and decision making. Its function is to decrease uncertainty."² As indicated, every artist produces data by making art. Critics, magazines, galleries, museums, collectors, and historians exist to create information out of unprocessed art data. History is uncertainty about art minimized.

A major illusion of the art system is that art resides in specific objects. Such artifacts are the material basis for the concept of the "work of art," But in essence, all institutions which process art data, thus making information, are components of the work of art. Without the support system, the object ceases to have definition; but without the object, the support system can still sustain the notion of art. So we can see why the art experience attaches itself less and less to canonical or given forms but embraces every conceivable experiential mode, including living in everyday environments. Thus art, according to John McHale, becomes "temporal immersion in a continuous contextual flow of communicated experiences."³

Examine the function of information in art: communication theory states that information is obtained when a signal reduces uncertainty within a system. Information is need required; hence information for a system has high entropy-reducing potential (negentropy). Negentropy is the ability of information to increase the structure and potential energy within a system. Such information is only obtained by expending the energy of systems outside the one receiving information. Thus the art system has maintained its vitality by constantly reaching outside of itself for data. In the past this has taken the form of new subject matter, materials, and techniques. But art now challenges the entire art information processing structure, not merely its content.

Encoding information always involves some physical process. In high-speed processing this takes the form of digital computer "hardware." The procedures or programs for processing data are called "software." For all previous art, distinctions between software and hardware were not recognized, so that encoding took the form of other art media and materials, where some information was lost, and perhaps some gained. Graphic reproductions of original works of art were a form of advertising. We now look upon them as works of art in their own right. Electronics have taught us that we often confuse software with its physical transducer. In other words, if we extend the meaning of software to cover the entire art information processing cycle, then art books, catalogs, interviews, reviews, advertisements, sales, and contracts are all software extensions of art, and as such legitimately embody the work of art. The art object is, in effect, an information "trigger" for mobilizing the information cycle. Making, promoting, and buying art are *real time* activities. That is to say, they happen within the day-to-day flow of normal experience. Only Art Appreciation happens in ideal, nonexistential time.

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Ideal time and "experimental idealism"⁴ are both outgrowths of the classical frame of reference. They stem from the intuition that, location and proportion transcend the illusion of time. Classical scientific methodology, as Spengler pointed out, is so premised. In both classical artistic and scientific experimentation the strictest control is exacted over isolated formal relationships. Only under such conditions may variables be compared. Reduction, isolation, and manipulation are the foundations of the Classic inventive structure—in art or technology. The problem of form and anti-form represents polarities of this structure, not an alternative. Paralleling experiments in Classic science, works of art are simplified models of complex, unmanageable situations. To insist upon the "reality" or "anti-illusionism" of such art, no matter how informal or diffuse its limits, is to deal in tautologies. All models also exist in real time. To sum it up, "style" is the artist's choice of invariants—used to excess.

Experimental idealism rests upon the intellectual and physical isolation of the esthetic experience. Its tools are picture frames, bases, spotlights, guards, galleries, hypostatic objects, and the concept of "high art" itself. It suggests that sensually the world is impossible as experience and must be broken down into palatable sanctuaries. Herbert Marcuse indicates that esthetics originally pertained to the study of the senses. By the end of the 18th century, esthetics had a different meaning: it referred to the study of beauty and specifically beauty related to art.⁵ All of which is reminiscent of the words of one young lady: "I don't mind New York City, I just shut off my senses and visit the Met on weekends."

To interpret pragmatism either as a rejection of illusionism and its attendant idealities, or as an appreciation of contextual differences, or as a kind of tough-minded precisionism rooted in literal description, is to underestimate the intentions of one of its founders. As a psychologist, William James realized the scientific value of ordinary, unprepared events; he also understood that such events represent infinite amounts of raw data which defy scientific scrutiny. His alternative was to return to freer and more existential investigation, fully recognizing the limitations of scientific "law." "Concreteness," "adequacy," "facts," "action," and "power" are words used by James to describe the methods of pragmatism; however the essence of pragmatic conduct is an ability to remain open and flexible despite conflicting experiences. As a result, correlating experience into a coherent picture of reality is the pragmatist's only objective.

Since the beginning of archeological research into art, theories of art have sought a lateral and vertical synthesis of cultural values, promoting the idea that these theories all represent disparate aspects of the "art impulse." But I agree with Alan Watts that, "What our museums now exhibit as the 'art' of other cultures and ancient times are religious, magical, and household utensils exquisitely and lovingly made." In other words we have imposed upon earlier cultures a conception of high art that justifies *our* value system—not theirs. The problem gets knottier as we see discrepancies between contemporary conceptions of high art. Judging different kinds of art by different criteria is one solution. Multiple value systems, however, were not what James had in mind. As long as there are conflicting experiences, James would insist upon a moratorium. Pragmatism is the recognition that science and technology have fragmented the traditional value structure beyond repair. Thus enclaves of protected values, including art, are fast disappearing.

In societies where existing values adequately deal with the environment, there are no comparative values—only the existing way of life. Values are nonexistent in metabolically stable societies. Hopefully such a metabolic reorganization is under way and will lead to a convergence of global information structures with parallel rather than linear processing. Such is the implication of McLuhan's assertion that the world is on the verge of tribalism, at this stage taking the form of similar patterns of global unrest. In this sense, the image of transcontinental tribalism through electronic technology is far from fanciful hyperbole:

At the global level, as in man's natural symbiotic relations with plants and animals, his relationship to cybernetic systems has been subtly changing toward a more closely woven organic interdependency resembling his other ecological ties.

The point reached recently when such systems were combined with the remote sensing, monitoring, and control capacities of the orbiting satellite marks the extension of this symbiosis to include the entire planetary ecology.

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The most pervasive aspect on earth has been the automation of production, services, and information flow in the advanced economies. Man's social role and position in society becomes less and less determined by the part he plays in direct production of material wealth goods, the organizing of routine information, or the performance of some standard physical service.⁷

Quite evidently, where advanced technology takes over, our values are chosen for us—if survival remains high on our list of priorities. Moreover, such a reversal demolishes the Classical Ideal. Both in the sciences and in the humanities something is rapidly happening: we are beginning to see scientific “objectivity” as an illusion, as are the notions of independent scientific “disciplines,” of isolating subjects of scientific inquiry from their settings, and of the possibility of making unobtrusive measurements.

Such symptoms point to a convergence of knowledge and activities; in a primitive fashion we are beginning to accept the Earth and its “guests” (to borrow from Buckminster Fuller) as a total organism with its own metabolism. Objectively we know very little about the rules of this metabolism. But we know that organic stability is predicated upon extensive communication networks, including memory, feedback and automatic decision-making capacities. The rudiments of such networks already exist, in the form of large-scale digital computer control systems. SAGE, the first computer-based air defense system; Project Mercury, the first real time digital support system for space flight; Telefile, the first online banking system; and SABRE, the first computerized airline reservation system are a few of many operating *real time* systems which gather and process data from environments, in time to effect future events within those environments.

Emotionally most humanists share an instinctive antipathy for these immensely complex computer systems. Their Orwellian overtones far overshadow their conceivable use as artists' tools. But practically, it is imperative that artists do understand them—both technically and philosophically. These computer systems deal with *real time* events, events which are uncontrived and happen under normal circumstances. All of the data processing systems I have referred to are *built into and become a part of* the events they monitor. Already a large part of the metabolic information used to run the military and commercial interests of the United States is real time-oriented. It is not proposed that artists have the choice between traditional media or using the computer. What I am saying is that the realtime information processing mode is rapidly becoming the routine style of handling information.

To date, most artists have been archivists doing the bulk of the art historian's task. The larger implication of this is that since the Renaissance the self-metaprogram of art has been predicated upon nostalgia. Recapturing a real or imagined classical past has been its goal. Modern art is the trauma of moving further and further away from that ideal. The public has been taught to buy and hold on to historical records in the guise of art. What a few artists are beginning to give the public is real time information, information with no hardware value, but with software significance for effecting awareness of events in the present. As long as museums refuse to acknowledge this transformation, they will remain in a peripheral and potentially obsolete role in relation to the most advanced aspects of contemporary art.

Deftness is the mark of the more sensitive artists using real time—the way in which they acknowledge systems. Here I think the work of Hans Haacke has consistently developed since 1963. His first works with water, emulsions, steam, and air had elements of strong geometric containment. These were plainly gallery objects. This cannot be said of the early sail pieces and outdoor balloon lines. Here the decision to allow natural entities to “organize” themselves began. We see this in the artist's plans (or the 1966 art festival at Scheveningen, Holland: “. . . a 150' plastic hose, tightly inflated with helium, will fly high above the beach or sea . . . And also, I would like to lure 1000 sea gulls to a certain spot (in the air) by some-delicious food so as to construct an air sculpture from their combined mass.”⁸

In much the same sense Haacke's *Spray of Ithaca Falls: Freezing and Melting on a Rope* depended upon environmental conditions. A nylon rope was wrapped in screening and suspended across the falls. Flowing water and freezing cycles quickly built a snow and ice configuration over a four-day period. A desire to work in neutral, non-art circumstances was evident in Haacke's *Wind Room* (summer, 1968) at the Mexico City University Museum. It consisted of an open, monochrome space bordered on two sides by heavy mesh screens, masking the air distribution system.

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Some recent tendencies in Haacke's work intrigue me. One is a willingness to use all forms of organic life—from the most elementary to the most complicated. This seems a logical extension of his philosophy of natural systems. A work of last winter involved the incubation of chicks as an ongoing process. Already Haacke is planning more complete animal "ecologies" where information is derived from the normal activities of animals in their environments. For a museum, he is planning a steady output of statistical information about visitors involving a small process-control computer and a display device. Two years ago Haacke would have balked at using this kind of technology; today, working more closely with events, it becomes a necessity. As Haacke explains:

*The artist's business requites his involvement in practically everything . . . It would be bypassing the issue to say that the artist's business is how to work with this and that material or manipulate the findings of perceptual psychology, and that the rest should be left to other professions . . . The total scope of information he receives day after day is of concern. An artist is not an isolated system. In order to survive . . . he has to continuously interact with the world around him. Theoretically, there are no limits to his involvement. . . .*⁹

John Goodyear has departed from Haacke's steam and ice pieces in a series of "heat tubes." Some of these are arrays of tubes with constant temperatures; others temporally fluctuate from hot to cold. As Goodyear has progressed, his constructions look less like sculpture and begin to resemble wall fixtures and unspecific utilities. One of the best is a semi-buried series of plates and pipes entitled *Snowmelter, Measurer* (1968) which acts symbiotically with the weather, possessing no iconographic value.

I found Dennis Oppenheim's exhibition last January the most provocative of the season. The models and documents presented moved beyond his previous "ground systems" to a broad use of interacting ecologies. It included the farm systems of the previous summer, the Connecticut forest floor "removal" and "transplant" pieces of that fall, the New York Stock Exchange transplant, and the "time" and "border" activities of his December visit to Maine and Canada. Oppenheim's use of tractors, snowplows, airplanes, and seacraft are normal uses of available technology. This makes real sense compared to most hardware exotica out of the studio.

In July, 1968, Oppenheim directed the harvest of a 300 by 900 foot oat field in Hamburg, Pennsylvania. Cutting, gathering, baling, and trucking of bales were stages of the art process documented. At that time the artist planned a work for the summer of 1969 in which "isolated episodes will be directed towards a core network involving every permutation (from planting to distributing the product)."¹⁰ This began last April in Finsterwolde, Holland, and is still to be completed. The parameters of this project are more complicated than the one in Pennsylvania, but Oppenheim does specify that "a portion of this crop will be selected by the artist and sold in 25-pound sacks. Also four carloads of wheat will be purchased from the Dutch commodity exchange in Amsterdam, and sold short in the United States."¹¹

The significance of this project is that Oppenheim is using the untapped energy and information network of the day-to-day environment. Such situations produce abundant information with a minimum of reorganization. Seen from the artist's point of view, Oppenheim explains that:

*In ecological terms what has transpired in recent art is a shift from the "primary" homesite to the alternative or "secondary" homesite. With the fall of the galleries, artists have sensed a similar sensation as do organisms when curtailed by disturbances of environmental conditions. This results in extension or abandonment of the homesite. The loft organism, stifled by the rigidity of his habitat, works on, not recognizing that his output is waning, by contemplating new ways to work within old bounds.*¹²

Signal recognition that art is information processing appeared with Conceptual Art. In Sol LeWitt's words, "Since no form is intrinsically superior to another, the artist may use any form, from an expression of words (written or spoken) to physical reality, equally."¹³

One of the early conceptualists, Douglas Huebler has recounted his gradual withdrawal from the making of art objects. As a "second generation" Minimalist, he was forced to consider context. Some works diminished substantially outside the gallery, raising the question of sculpture competing with "real things" in the outdoor environment. He saw art objects as a series of strategies for reducing ambient dominance—while, paradoxically, such rivalry seemed out of place:

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An object may defeat or suspend the competition of other things by being made more "interesting": larger and/or with intensification of color, formal complication, etc. However, I see such adjustments as a kind of "mannerism". . .

I choose not to make objects . . . instead I have set out to create a quality of experience that locates itself "in the world" but is not called upon to "judge" nor to infer "meaning" from particular appearances. I now make work that consists of "documents" that form a conceptual "frame" around a . . . location.¹⁴

Huebler's November, 1968 catalog may become the most important "show" of that year. His documentation is less visual than Oppenheim's. *42° Parallel*, involving the sending and receiving of postal receipts to ten towns on the 42° latitude, is simply an annotated map of the United States, photographs of the dated receipts, and a written description.

Rock #2 was "found" while D. Burgy was walking in the fields and woods of Bradford, Massachusetts, on September 4, 1968. It exists as a collection of about thirty documents " . . . from the geologic past to the present moment; and in material size, from the continental to the atomic. The techniques of recording are appropriate to the kind of information presented and include visual, verbal, and mathematical data."¹⁵ The rock is no capitulation to Dada notions about sculpture. Burgy maintains that it is "objective information about his experience in the world." It could be any rock, but it isn't; and it presents in uncompromising terms the nexus of art information, namely focus on experience. Visually this is manifested at a number of resolution levels: the rock appears under an electron microscope at 1250 power, and then from 2 feet, 10 feet and 20 yards, from 500 feet in an airplane, from 500 miles in a space satellite, and from an assortment of official survey maps.

Focus for Robert Barry is reversed: it is what we know about an environment without seeing or experiencing it. Radiation from a vial of Barium-133 buried in Central Park is simply Central Park. Most "air art" is air-supported hardware. But Seth Siegelaub's poster for Barry's "Inert Gas Series" is eminently software, a blank white 22 1/2 by 35 inch sheet with one small line of information at the bottom. On another level Joseph Kosuth and Steven Kaltenbach have used printed media with an eye for all possible spin-offs. Kosuth's present exhibition of duplicate advertisements in ten different cities, and their museums, is the essence of data dispersion.

For over a year Siegelaub has been "gallery director" for the best of the conceptualists. His publications of calendars and catalogs are already collector's items. That he has already evolved a nonstyle was demonstrated by his exhibition of Barry, Huebler, Kosuth, and Weiner last January. Held in a rented office of the McLendon Building on 52nd Street, the room contained catalogs on a coffee table and a few places to sit. Siegelaub is obviously one of the best artists in his gallery, and in a sense his artists know it. They are subcontracting to his prime contract as a data organizer.

Art as information processing leaves little in the way of protection for the artist. Style used to be the art system's equivalent to patent rights. And even among the conceptualists one senses a certain degree of deference and respect for each other's ideas. But if the output of artists continues to be based upon nonsequential ideas, it may be impossible to support the notion of "ownership." Such ownership amounts to who *amplifies* original data first so that it becomes information. For instance, a particular electronic circuit may be discovered a dozen times before it is invented. "Invention" takes place only when a large firm uses the circuit in a major production, and then has it entered into an electronic handbook. The design engineers of that particular company then become "inventors." As an information organization principle, this has been expressed by the ecologist, Ramon Margalef. According to Margalef, boundaries between systems in nature are usually asymmetrical. More organized systems always gain information and energy from less organized systems. This pertains to the relations between plants and animals, atmosphere and sea, environment and thermostat, enzyme and RNA molecule, biotope and community, prey and predator, agrarian communities and industrial societies. In each case the last named system feeds on the energy surplus of the first:

It is a basic property of nature, from the point of view of cybernetics, that any exchange between two systems of different information content does not result in a partition or equalizing of the information, but increases the difference. The system with more accumulated information becomes still richer for the exchange. Broadly speaking, the same principle is valid for persons and human organizations: any exchange increases to a greater extent the information of the party already better informed.¹⁶

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Little imagination is needed to realize how this principle operates within the art system. As the fame of a living artist grows, he ceases simply to make data. His subsequent output is information since it is already art history. Plagiarism of existing information, *i.e.*, the work of well-known artists, has minimal energy—unless original information becomes the object of new data in a very convincing way. On the other hand, famous "avant-garde" artists may capitalize upon the work of their lesser known contemporaries. Being better organized systems, established artists have greater access to museums and media. It is important, however, that they use such material while it is still data, *i.e.*, before it becomes art information.

On a personal level Margalef's cybernetic principle remains a matter of ethics and practicality. But its implications for the total art information system are far-reaching. As information processing becomes more generally understood, institutions and persons—other than artists—will insist upon creating their own art information. Specifically I am thinking about projects which demand money, planning, and technical support far beyond the individual artist's means. Artistic endeavor is thus brought up (or down) to the level of corporate research. We have only to think of that saga of lonely enterprise, the inventor-hero-capitalist. Such a social ideal was only possible in a society with no scientific grasp of the nature of information.

The altruism of artist groups has rarely survived the commercial success of one member. Pulsa, of New Haven, may be different—if it can hold on economically. With members ranging from mathematicians and computer specialists to painters, their focus is on computer-based programs of light and sound output. But it is in the realm of group interaction that Pulsa projects, hopefully, a new breed of artists. The group does not produce conglomerates of separate works by individuals, but rather common projects. As much as possible, all esthetic and technical decisions are shared equally. Ego frictions between technicians and artists seem to have been brought to a minimum.

*Like the human brain, Pulsa operates on principles of parallel processing . . . approaching a point at which specialization becomes irrelevant due to the fact that the operating control system speaks a simplistic environmental language or even operates autonomously. In this sense their objective is an intelligent system which in itself embodies the optimum state of the group's and the system's interactive functioning, which itself constitutes the ultimate work of art.*¹⁷

Having witnessed Pulsa's activities over a year, I am convinced that there is substance behind these words. Ultimately Pulsa see themselves as planners and coordinators, functioning in the industrial, urban and natural environments. However, the full impact of taking art out of its socially acceptable surroundings did not reach me until last winter. I flew in a plane over the Pulsa installation on the outskirts of New Haven, circling into their light configurations for about ten minutes before heading east for Boston. Five minutes away I overheard a radio conversation between a small plane and air control at New Haven airport. The plane reported a "disturbing" light phenomenon on the ground. Air control told the pilot to file a complaint with the CAA.

There are two kinds of artists: those who work within the art system, and those few who *work with* the art system. Les Levine epitomizes the second type. Few people grasp this fact, or its implications, and to dismiss Levine's work as Dada or *kitsch* is missing the point. Where industrialists think of art as a good tax dodge or as a kind of pastoral retreat, Levine considers business and industry to be art in its most essential form.

Every artist of any substance sells his art through shrewd advertising and press agency. For Levine these are legitimate art forms. Artists are beginning to use signed releases, contracts, and sales conditions as supplementary art information; Levine has done so for years. The fact that he uses them so blatantly, with no deference to the professional gentility of the art system, is the equivalent of style. The worst mistake would be to read taste or style into objects which he has fabricated. Despite the fact that all successful commodity art has to be uncommonly "pretty" and have a convincing pedigree, Levine's plastic shapes are neither. They are direct, raw, neutral results of quantity production. Neither should his objects be considered *multiples* or merely small-sized quality artworks. Levine, I feel, has set out to vindicate the art system, namely that anything can be sold with enough public relations energy behind it. His integrity lies in the fact that he has refused to feed collectors' neuroses with illusions of permanence and quality. Levine states:

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*All process oriented works rely on the viewer and the art critic for their final definition as works of art. If it is neither photographed nor written about, it disappears back into the environment and ceases to exist. Many serious artists at this time, are for the most part involved in making art producing systems. The works themselves are not to be considered as art, rather systems for the production of art.*¹⁸

On March 27, 1969, Levine bought five hundred common shares of stock in the Cassette Cartridge Corporation; when resold the profit or loss became the work of art. His coin and airline projects have been conducted similarly, using existent societal systems. Inflation-wise, prestigious commodity art is better than money. As I see it, Levine is simply circumventing the roundabout process of producing paintings and sculptures for sale and, instead, making the message—money—become the medium. Some artists involved in "process" announce their projects in archaic art formats; Levine's typically is a press release. In an age when technological processes define lifestyle, "Choice and taste can only be considered neurotic."¹⁹ He goes on to write:

*I've never seen a work of art I didn't like: Good or bad are irrelevant in terms of process. On a process level being totally excited is of no more value than being totally bored. If you run around in your backyard and make a good painting, it's just the same as running around in your backyard and making a bad painting. Running around is running around.*²⁰

Levine's Restaurant at 19th Street and Park Avenue South is a Levine; which is to say, it is refractory, plastic, and the ultimate real time artwork devised to date. The restaurant is process in all its vicissitudes. For my taste, his closed-circuit television and color scheme leave much to be desired, but the food is very reasonable. Levine worries and tinkers with the software, and appears to be more concerned with write-ups in *Restaurant News* than in *Art News*. Levine's lacks that much-admired Howard Johnson sterility, but he keeps trying. On the art level, it has to be accepted for what it is: a self-organizing, data generating system. What other artist has a gallery showing his work fourteen hours a day seven days a week, always changing, charging no commission, and allowing him to eat free?

At present the art communication and education structure is hardly prepared to handle such a broad conception of art as *Levine's*. For that matter, it breaks down frequently with current definitions. Any fundamental shift will probably involve the complete absorption of art into the media. But the reality of art continues to reside in its unreality. Any progress in the development of real time art recognizes that conceptual focus must keep the two apart. In this respect, the hoax of treating artists as social beautifiers should be exposed once and for all. As McLuhan insists, the artist is fundamentally antisocial. To use another cybernetic analogy, artists are "deviation-amplifying" systems, or individuals who, because of psychological makeup, are compelled to reveal psychic truths at the expense of the existing societal homeostasis. With increasing aggressiveness, one of the artist's functions, I believe, is to specify how technology uses us.

Art is becoming a matter of ecological insight. The Berkeley *People's Park* is a real time work of art. Even as a decimated cyclone-fenced lot, it challenges societal norms in the most fundamental way. As thirty thousand people marched from the *People's Park Annex* for the Memorial Day Protest last May, dozens of grass plots appeared on concrete and asphalt. A loudspeaker played "Why Don't We Do It in the Road?" In a country of 100,000,000 vehicles, what better gallery could you find?

—*Jack Burnham*

NOTES

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